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Modern Methods of Clinical Diagnosis of Obstetric Hemorrhage

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Abstract: Bleeding remains the most serious problem in obstetric practice. The arsenal of modern means for the prevention and treatment of obstetric bleeding, as well as the sequence of emergency medical care in maternity hospitals, have reduced the total incidence of bleeding during childbirth and postpartum. However, it is still not possible to completely prevent negative consequences during pregnancy and childbirth. Mortality in obstetric bleeding is determined by two main factors: delayed inadequate hemostasis and improper infusion-transfusion therapy. The article is devoted to the doctor's tactics in bleeding associated with premature placental abruption, uterine rupture, anomalies of placental attachment and location, uterine hypotension and the principles of infusion-transfusion therapy.

Keywords: obstetric hemorrhage, infusion-transfusion therapy.

Introduction: Currently, obstetrics has a sufficient arsenal of tools for the prevention and treatment of bleeding during and after childbirth. Concepts of high-risk groups for the development of bleeding in pregnant women have been developed, methods of birth control are being improved, uterotonic agents are widely used in the third stage of labor to prevent bleeding. In recent years, organizational measures - the stages and sequence of emergency medical care in maternity hospitals - have been improved. All of the above measures have reduced the incidence of bleeding during childbirth, but are not yet able to completely prevent the negative consequences of pregnancy and childbirth [6 , 8].

In recent decades, the frequency and structure of obstetric hemorrhages have changed significantly. Against the background of an increase in the percentage of hemorrhages associated with premature placental abruption and the development of DIC syndrome, there is a tendency to reduce the frequency of hypotonic hemorrhages in the third stage of labor and in the early postpartum period. This group of hemorrhages is characterized by significant intensity, requires a large amount of assistance and is noted for the worst prognosis. Currently, ultrasound allows for timely detection of the anterior position of the placenta, hospitalization of the pregnant woman and, in many cases, avoiding significant blood loss [1 , 10]. With pathological blood loss of no more than 1000-1200 ml, autohemodilation mechanisms are activated. Depending on the adaptive capabilities, such blood loss can be quickly compensated. In the presence of background pathology during pregnancy and childbirth, the mechanisms for compensating for bleeding are quickly exhausted. As a result of an increase in the discrepancy between the BCC and the capacity of the vascular bed, signs of decompensated blood loss appear, that is, hemorrhagic shock. Based on the fact that hemorrhagic shock is a multi-organ failure caused by massive blood loss, it is necessary to distinguish iatrogenic ones among the predisposing factors: untimely initiation of infusion-transfusion therapy, insufficient rate and volume of administered solutions, improper selection of high-quality and corrected solutions, hemorrhagic shock. inadequate assessment of the patient's severity, incorrect or delayed selection of methods for the final stop of bleeding [4 , 5 , 11].

Research methods and materials: The terminal stage occurs when adaptive abilities fail. The main consequence of blood loss, which triggers a chain of pathological reactions, is a sharply developing mismatch between the volume of circulating blood and the capacity of the vascular bed, anemia and circulatory forms of hypoxia. Tissue hypoxia leads to a violation of redox processes with predominant damage to the central nervous system, kidneys, liver, adrenal glands and other body systems. Water-electrolyte balance, acid-base balance, enzymatic processes and hormonal ratios are disturbed.

In contrast to all bleeding, which occurs in 2.7-8% of all births in pregnant women, women in labor, and women in the postpartum period, the frequency of massive bleeding is 0.1-0.2%. Obstetric bleeding can occur during pregnancy, childbirth, the postpartum period, and the early postpartum period.

Bleeding due to pregnancy and childbirth:

a. termination of pregnancy;
b. ectopic pregnancy;
c. trophoblastic disease;
d. extragenital pathology;
e. premature detachment of a normally located placenta;
f. uterine rupture;
g. anomalies of placental attachment and placenta previa;
h. hypo- and atonic bleeding in the postpartum and early postpartum period;
i. uterine prolapse;
j. soft birth canal injury;
k. retention of placental fragments in the uterus;
l. hereditary and acquired defects of the hemostasis system;
m. workforce anomalies;
n. iatrogenic causes (unjustified prescription of uterotonic drugs, inadequate pain relief during childbirth, obstetric care and operations, errors in managing the third stage of labor);

Results: One of the main factors increasing the percentage of obstetric hemorrhage is the increase in the number of deliveries through the abdominal cavity. The frequency of cesarean sections varies from 2 to 40% of the total number of deliveries. In Russia, this figure has averaged 12% over the past decade. The frequency of cesarean sections is associated with an increase in the number of primiparous women of advanced age, extragenital pathology, fetal indications, and the widespread introduction of advanced reproductive technologies into clinical practice. With an increase in the number of cesarean sections, the incidence of repeated abdominal births also increases. Its most common complication is bleeding, the frequency of which is 4 times higher than that of spontaneous births [9 , 12].

Bleeding remains the most serious problem in obstetrics, as it accounts for 20-25% of maternal deaths in its pure form, 42% as a competing cause, and 78% as a background cause [1 , 5 , 7 , 10]. The incidence of obstetric bleeding is from 3 to 8% of the total number of births. In maternity hospitals in St. Petersburg, this figure is 3%. According to WHO, 125,000 women die from bleeding every year. In recent years, maternal mortality from bleeding in St. Petersburg has been 4.2 per 100,000 live births. Mortality in obstetric bleeding is determined by two main factors: delayed adequate hemostasis and incorrect infusion-transfusion tactics [7].

Acute blood loss has a profound effect on the body and leads to changes in the functioning of all organs and systems. According to current concepts, changes in the body during blood loss can be divided into several stages: initial, compensatory and terminal. In the first two stages, adaptive mechanisms work, helping to maintain homeostasis at one level or another.

Primary functional changes during blood loss aimed at compensating for hypovolemia

The body's main reactions to acute blood loss depend on the rate and volume of blood loss and the initial condition of the body.

The need for accurate, reliable determination of blood loss in clinical practice is difficult to overestimate. Despite the variety of methods proposed, this problem cannot be considered solved. Determining blood loss during cesarean section is especially difficult.

In clinical practice, a visual method of determining blood loss is often used, but even among experienced specialists, the error is up to 30%. The degree of BCC deficiency is reflected by the Algover shock index (the ratio of heart rate to systolic blood pressure) (Table 1).

It should be noted that the Algover index is not informative in patients with hypertensive syndrome.

Blood loss volume = B / 2x15% (with blood loss < 1000 ml), where B is the weight of the wipes, 15% is the error value for amniotic fluid.

Blood loss volume = B/2Ch30% (with blood loss > 1000 ml).

The Nelson formula is based on hematocrit values.

This method is 96% reliable, but is only informative when the hematocrit is determined after 24 hours; in addition, it is necessary to know the initial hematocrit.

Currently, the most objective method is the radionuclide method of studying BCC, the error of which is 3-5%.

The physiological blood loss during childbirth is no more than 0.5% of body weight. In case of borderline blood loss (400 ml), the blood loss should be recalculated relative to the woman's body weight for its individual value.

Factors determining the individual reaction to blood loss include gestosis, anemia, hypovolemia, chronic disseminated intravascular coagulation, congenital disorders of the hemostasis system, low body weight, extragenital diseases (heart defects, heart failure), complications of childbirth, polyhydramnios, multiple pregnancy.

Bleeding greater than 1000 mL (>20% of CBV) or 15 mL/kg of body weight usually results in hemorrhagic shock. Ongoing bleeding greater than 1500 mL (>30% of CBV) is considered massive.

The main task of the obstetrician in case of bleeding is the timely application of the most effective and reliable methods of stopping it, adequate infusion-transfusion therapy, and the correct selection of anesthetic care before the onset of hemorrhagic shock, since violations of macro- and microcirculation involve the most important systems of the body, disrupting pathological processes.

One of the types of obstetric pathology that threatens the health and life of a woman due to possible massive obstetric bleeding is placenta previa (0.2-0.8% of the total number of births). Over the past 10-15 years, its frequency has increased, which is explained by an increase in the number of intrauterine interventions. Predisposing factors are morphological changes in the endometrium in women with a complicated obstetric and gynecological history. Among the factors contributing to the occurrence of placenta previa, it is worth mentioning the presence of scars on the uterus and uterine fibroids. Complete placenta previa in full-term pregnancy, detected by ultrasound, is an absolute indication for cesarean section before the onset of bleeding. In case of incomplete placenta previa, delivery through the natural birth canal is permissible with moderate blood loss (no more than 250 ml), satisfactory labor activity and sufficient dilatation of the cervical os (5-6 cm) after initial amniotomy. Continued bleeding in a volume of more than 250 ml, incomplete placenta previa and the absence of conditions for rapid delivery are emergency indications for cesarean section. The risk of significant blood loss and hemorrhagic shock does not disappear after delivery. In the early postpartum (postoperative) period, the risk of placental abruption is high, which is associated with insufficient reduction of the lower uterine segment, as well as a significantly more frequent combination of the placenta previa with partial placenta accreta. Therefore, during cesarean section or vaginal delivery, it is necessary to prevent bleeding with the help of uterotonic agents. Currently, misoprostol (a synthetic analogue of prostaglandin E1) 600-1000 μg rectally is used to prevent early postpartum hemorrhage at

the DO Otta AG Research Institute and abroad [14]. If placental separation is difficult, the possibility of accreta should be considered and immediate uterine extirpation should be performed.

A specific danger of massive obstetric hemorrhage is premature detachment of a normally located placenta (0.5-1.4% of the total number of births). In 30% of cases, it leads to massive bleeding, which is fatal. Premature detachment of the placenta occurs most often during pregnancy, less often during labor. In the pathogenesis of predisposing factors, chronic disorders of peripheral blood flow in patients with gestosis and extragenital diseases (glomerulonephritis, hypertension, infectious-allergic vasculitis) play an important role. Most authors studying this problem consider the most important factors of pathogenesis to include hemodynamic and microcirculatory disorders in the utero-placental circulation, as a result of which the most important functions of the fetoplacental system are disrupted [1 , 3 , 8 , 10]. The main task of the obstetrician-gynecologist is to ensure a quick and gentle delivery, depending on the conditions. Timely surgical intervention in the early stages of placental abruption prevents massive blood loss and preserves the uterus. It should be noted that the causes of bleeding in the early postoperative period in women after childbirth with acute placental abruption are multifactorial. Therefore, conservative measures should be limited to the use of uterotonic agents and external uterine massage. If bleeding persists, uterine extirpation is indicated.

In the case of vaginal delivery with premature placental abruption after delivery of the fetus, manual separation of the placenta and postpartum extraction are performed to quickly empty the uterus. In the case of spontaneous placental abruption, manual examination of the uterine cavity is mandatory.

The most severe injuries of the birth canal, accompanied by painful shock (often combined with hemorrhagic shock), are uterine rupture (0.02-0.1% of the total number of births). The medical tactic for the threat or completion of uterine rupture is immediate laparotomy. If there is a threat of uterine rupture, a cesarean section is performed after preoperative tocolysis (bolus form of ß-adrenergic agonists). When a rupture occurs, the choice of the optimal option varies between suturing the rupture and removing the uterus. If there is no infection during labor, but there is a linear rupture (especially along an old scar), then suturing the rupture is allowed after preliminary updating of its edges. In case of extensive wounds with torn and crushed edges, severe injuries affecting the lower segment, extending to the cervix or vagina, extirpation of the uterus is required [1 , 12].

The causes of bleeding in the third stage of labor and the early postpartum period are retained placental fragments, abnormal attachment of the placenta, damage to the soft birth canal, hemostasis defects, and uterine hypotension (2.5-8% of the total number of births). Management of the third stage of labor is of great importance. Manual separation and removal of the placenta is carried out in the following ways:

if there are no signs of placental separation and bleeding within 20 minutes after childbirth;

with blood loss of 250 ml against the background of ongoing bleeding in the absence of signs of placental abruption.

Differential diagnosis of placenta accreta and placental adhesions is established during manual separation. In true placenta accreta, manual separation is unsuccessful. In this case, it is necessary to abandon forced manual manipulations and perform amputation or extirpation of the uterus.

Discussion: Treatment of hypotonic hemorrhage should be early and comprehensive. It consists in stopping bleeding, normalizing hemodynamics and correcting hemostasis disorders. Treatment begins with conservative methods: emptying the bladder, external uterine massage, administration of uterotonic agents (oxytocin, methylergometrine, prostaglandins F2a, misoprostol). Endogenous oxytocin is the regulator of the active phase of the labor period and the early postpartum period. Compared with the onset of labor, its plasma concentration increases more than 3 times during the labor period. The short half-life of oxytocin (4-5 minutes) makes it practically ineffective when administered intramuscularly or intravenously at the same time. Therefore, for the treatment of hypotonic hemorrhage, it is recommended to administer oxytocin intravenously (5-10 U per 250-500 ml of isotonic sodium chloride solution or 5% glucose solution). Methylergometrine has a slower

uterotonic effect, but lasts longer than oxytocin. Therefore, its intramuscular administration should be combined with intravenous oxytocin.

Manual examination of the uterine cavity is performed only once under high-quality anesthesia, which eliminates the pain component. The earlier this manipulation is performed, the higher its effectiveness. Manual examination of the uterine cavity has the following goals:

Some authors recommend bimanual uterine compression, in which one hand is placed in the anterior vaginal opening, and the other hand is placed through the abdominal wall to compress the posterior wall of the uterus, creating a "hyperanteflexion" position that facilitates compression of the uterine vessels. After manual examination of the uterine cavity, it is necessary to completely revise the soft birth canal and suture existing lacerations. This not only stops bleeding, but also reflexively helps the uterus contract. A good hemostatic effect is achieved by rectal administration of PGE2a 5 mg or methylergometrine 0.2% solution 1.0 cervical, misoprostol 600-1000 μg. The lack of effect from manual examination of the uterine cavity against the background of the introduction of uterotonic agents indicates the coagulopathic nature of the bleeding and the need for a transition to surgical methods of treatment and urgent correction of the coagulation system.

Conclusion: It is customary to use 3-5 reliable methods to stop bleeding, which should never be repeated. If conservative treatment is ineffective, it is very important to choose the right time for radical intervention. The most common mistake is to delay the operation, which worsens the conditions for its implementation. Professor VF Snegirev was right when he wrote: "It is better to have a living woman without a uterus than a dead one with a uterus." If bleeding persists and blood loss exceeds 30% of the BCC, the question of hysterectomy should be raised. Amputation of the uterus is indicated only when the hypotonic component plays a major role; If there is coagulopathy, the uterus should be extirpated.

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